



12. ENVIRONMENTAL, SAFETY, AND HEALTH

This section outlines the roles and responsibilities of the team members responsible for protecting the environment, employees, and the public from the effects or outcomes of the project. It includes environmental protection, radiological controls, safety and health.

12.1 Environmental Protection Aspects

12.1.1 Environmental Requirements

The project team is conducting the project under the OU 7-10 Record of Decision (ROD). This Comprehensive Environmental, Response, Compensation, and Liability Act (CERCLA) ROD defines the applicable or relevant and appropriate requirements (ARARs) that must be implemented. The team is implementing the CERCLA ROD in accordance with the process outlined in the Federal Facility Agreement and Consent Order (FFA/CO) for the INEEL.

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- Conducts the project as a CERCLA project under the OU 7-10 ROD and FFA/CO
- Satisfies the requirements of ARARs
- Protects human health and the environment.

The project team will also satisfy internal INEEL requirements and DOE orders. Companywide Manual 8, "Environmental Protection and Compliance," documents the environmental protection program. Responsibilities for implementing the program are defined in a number of environmental program requirements documents and implementing MCPs. Environmental requirements and instructions associated with a CERCLA action are documented through implementation of MCP-3480, "Environmental Instructions for Facilities, Processes, Materials and Equipment." An environmental checklist, prepared in accordance with MCP-3480, will reference project ARARs and define additional environmental requirements for the project. As a facility managing low-level and transuranic mixed waste, DOE Order 435.1, "Radioactive Waste Management," applies and must be implemented. Additional DOE Orders defining environmental related requirements include DOE Order 5400.1, "General Environmental Protection Program" and DOE Order 5400.5, "Radiation Protection of the Public and the Environment."

Based on DOE policy, the CERCLA process is relied upon to address National Environmental Policy Act (NEPA) values and public involvement procedures. Consequently, no separate implementation of NEPA is required for CERCLA projects at INEEL.

The Environmental Affairs organization assigns a project environmental lead to ensure project environmental requirements are properly implemented, integrated into work planning, and ultimately satisfied.

12.2 Radiological Controls Aspects

The Radiological Control Program for the INEEL is documented in Manual 15A. This program meets the requirements of 10 CFR 835 and DOE O 441.1 series. The project manager has the overall radiological control responsibility for the project. Each person assigned to work on the project is responsible for proper radiological control (Rad-Con). The project team includes the Radiological Control Organization assigned to advise the project on maintaining compliance with the Radiological Control Program and supporting procedures.

12.3 Safety and Health Control Aspects

The project safety and health representative supports the project manager in implementing the project safety and health program. Safety and health is responsible for coordinating industrial safety and industrial hygiene (Company Manuals 14A and 14B) support within the Project. A Preliminary Documented Safety Analysis is being developed that will define the safety categories for the systems, structures, and, where necessary, the components.

The project fully embraces the INEEL Integrated Safety Management Program (ISMS), in both core functions and guiding principles. The core functions of ISMS are the following:

- Define the scope of work
- Identify the hazards
- Mitigate the hazards
- Perform work within their controls
- Provide feedback and lessons learned to continuously improve work processes.

The eight guiding principles of ISMS are the following:

- Line management responsibility for safety
- Clear roles and responsibilities
- Competence commensurate with responsibilities
- Balanced priorities
- Identification of safety standards and requirements
- Hazard controls tailored to the work being performed
- Operations authorization
- Worker involvement.

These functions and guiding principles will be used during project work performed by BBWI, and will be flowed down to subcontractors through subcontract requirements and for self-performed work through requirements defined in the work packages. Operations will flow down these principles and functions by incorporation into the operating procedures. Verification that ISMS has been incorporated into these documents will be accomplished using self-assessment programs.

Health and Safety Plans for specific field activities also identify safety requirements that will be included in the work control documents or subcontracts.

12.4 References

MCP references are generic in nature in CD-1. In the execution phase we will only call out MCPs and MCP sections that are applicable to the project.

10 CFR 835, "Occupational Radiation Protection."

29 CFR 1910, "Occupational Safety and Health Standards for General Industry."

29 CFR 1926, "Occupational Safety and Health Standards for Construction."

DOE G 441.1-1, "Management and Administration of Radiation Protection Programs Guide."

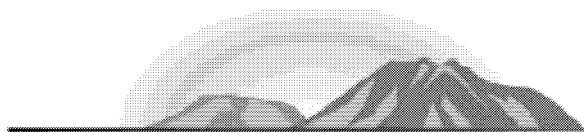
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Manual 14A, "Safety and Health, Occupational Safety and Fire Protection."

Manual 14B, "Safety and Health, Occupational Health."

Manual 15A, "INEEL Radiological Control Manual."



13. SAFEGUARDS AND SECURITY

The INEEL Safeguards and Security Program has an effective process to protect facilities, information, and nuclear material. The project team follows this same process to comply with DOE and INEEL requirements. They protect and control safeguards and security interests to preclude or minimize unauthorized access, unauthorized disclosure, loss, destruction, modifications, theft, compromise, or misuse to comply with DOE Order 5632.1C, "Protection and Control of Safeguards and Security Interests."

13.1 Security Plans

Project plans implement security requirements. Specifically, the "Project Physical Security Plan" (PLN-632) details the protection requirements, access controls, and sensitive unclassified and classified information control. It also details the Physical Security Planning. Also, a Contingency Plan details requirements if classified material is excavated.

Safeguards and Security:

- Protects project
 - Facilities
 - Information
 - Nuclear material
- Implements security requirements
- Addresses concerns of potentially classified excavated material.

13.2 Physical Protection

The project area is established as a property protection area to protect against damage, destruction, or theft of government-owned property. The property protection area complies with DOE M 5632.1C-1, "Manual for Protection and Control of Safeguards and Security Interests." The area has access controls, which were established according to MCP-303, "INEEL Access Controls," and Protective Force personnel control access to the area. It also has physical barriers. Security badges are required to access the area, and vehicles and items are subject to inspection.

13.3 Safeguards and Security Organization

Safeguards and Security professionals implement security requirements for the project. The project physical security officer ensures security requirements are implemented properly.

13.4 Control of Nuclear Material

The project effectively controls nuclear material to comply with DOE Order 474.1A, "Control and Accounting of Nuclear Materials," DOE M 474.1-1A, "Manual for Control and Accountability of Nuclear Materials," and Safeguards and Security Manual 11D, "Nuclear Material Control and Accountability." For example, project personnel calibrate project equipment using reportable quantities of nuclear material. In addition, the project manager appointed a nuclear material custodian to ensure the project receives, accounts for, and stores nuclear materials according to MCP-2756, "Nuclear Material Control." Moreover, the nuclear material custodian established a new Material Balance Area so that the nuclear material is properly controlled and stored according to MCP-2751, "Establishing Material Balance Areas and Appointing Nuclear Material Custodians." Finally, the project team acquires and transfers nuclear material, makes notifications, obtains approvals, and completes the required documentation according to MCP-2752, "Shipments and Receipts of Nuclear Material."

13.5 Classification of Excavated Material

The project has plans in place to resolve a potential concern with classification levels of excavated material. Specifically, some of the excavated material, which was from Rocky Flats, may be classified. Therefore, the INEEL Classification Office participates in the design reviews for construction and operation of the project to comply with DOE M 475.1-1, "Identifying Classified Information." The INEEL Classification Office identifies the classification level of excavated material according to MCP-309, "Classifying Information." If classified material is excavated, the project team suspends operations until appropriate protection measures are implemented.

13.6 References

MCP references are generic in nature in CD-1. In the execution phase we will only call out MCPs and MCP sections that are applicable to the project.

DOE M 474.1-1A, "Manual for Control and Accountability of Nuclear Materials."

DOE M 475.1-1A, "Identifying Classified Information."

DOE M 5632.1C-1, "Manual for Protection and Control of Safeguards and Security Interests."

DOE O 474.1A, "Control and Accountability of Nuclear Materials."

DOE O 5632.1C, "Protection and Control of Safeguards and Security Interests."

Manual 11D, "Safeguards and Security, Nuclear Materials Control and Accountability."

MCP-286, "Physical Security Planning."

MCP-303, "INEEL Access Controls."

MCP-309, "Classifying Information."

MCP-2751, "Establishing Material Balance Areas and Appointing Nuclear Material Custodians."

MCP-2752, "Shipments and Receipts of Nuclear Material."

MCP-2756, "Nuclear Material Control."

PLN-632, "OU 7-10 Staged Interim Action Project Physical Security Plan."



14. REFERENCES

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- 10 CFR 830.120, 2001, *Code of Federal Regulations*, Title 10, "Energy," Part 830, "Nuclear Safety Management," Section .120, "Scope," Office of the Federal Register.
- 10 CFR 835, 2000, *Code of Federal Regulations*, Title 10, "Energy," Part 835, "Occupational Radiation Protection," Office of the Federal Register.
- 29 CFR 1910, 2000, *Code of Federal Regulations*, Title 29, "Labor," Part 1910, "Occupational Safety and Health Standards for General Industry," Office of the Federal Register.
- 29 CFR 1926, 2000, *Code of Federal Regulations*, Title 29, "Labor," Part 1926, "Safety and Health Regulations for Construction," Office of the Federal Register.
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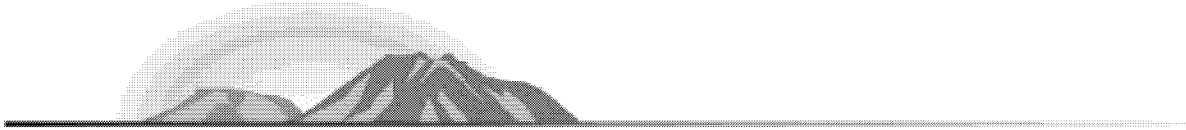
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Appendix A

Assumptions

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Assumptions

A1. SCOPE ASSUMPTIONS

A1.1 General

DOE Order 413.3, Critical Decisions and Enforceable Milestone. Assume that critical decisions based on DOE Order 413.3 are made at the DOE field office level and not elevated to DOE-HQ. Assume that Critical Decisions Partial 3a, Partial 3b, and 2/3 are completed to allow multiple procurement and construction packages to be issued to support a fast-track project schedule which permits erection of the weather enclosure prior to the onset of inclement weather in the fall of CY 2002. Assume that the technical, cost, and schedule baselines are set at the completion of Critical Decision 2/3 in accordance with DOE Order 413.3.

Funding Restrictions. The project planning through completion of the retrieval activities is based on the preliminary funding profiles. These funding levels will be updated based on the results of the estimate update performed in December 2001, based on completion of Conceptual Design. Please note that project funding will include DD&D in FY 04 and beyond.

Agency Interfaces. Assume that the project design consists of a conceptual design that proceeds to Title II design. Assume that agency reviews do not result in changes to established project objectives nor to Technical & Functional Requirements (see Conceptual Design Report). Assume that the FFA/CO-required prefinal inspection period is 20 days (5 days for EPA/IDEQ inspection and 15 days to resolve inspection observations). Assume that the agencies take 45 days to review the Remedial Action Report, and that it takes 45 days to incorporate comments. Assume that all requests for scope, schedule, or cost adjustments are handled through the formal change control process. Assume that the agency approval of vendor submittals is not required. Assume that an ESD or ROD amendment is prepared in parallel with design finalization and is not in restraint of schedule.

Environmental Regulation. Assume that because this project is a CERCLA remedial action, it will not be required to obtain environmental permits. Assume that the versions of the Applicable or Relevant and Appropriate Requirements (ARARs) that apply to Stage II are those in effect in the Federal Register when the ROD was signed, except as modified by the 1998 ESD, which incorporated the Toxic Substance Control Act ARARs and DOE 435.1 *Radioactive Waste Management*, in lieu of DOE 5820.2A. Changes will only be incorporated as agreed with DOE based on evaluation of scope, schedule, and cost impact through a formal change control process.

Outlier Materials. Retrieval, characterization, packaging, interim storage or disposal of any waste material (i.e., an outlier) that is not included in the documented safety basis is excluded work scope. Specifically, work associated with the evaluation and processing of a waste item through the Unreviewed Safety Question process that results in a revision to the safety basis is excluded scope. Outlier materials are assumed to include classified objects. Excavated materials may be returned to the pit after evaluation in the glovebox and determined to be outliers.

LMAES Interface. Assume permission is obtained from LMAES for the construction and operational interfaces which are defined in the draft LMAES interface agreement.

Current INEEL Procedures. Assume that the project will be performed using current INEEL procedures in effect at the time of Conceptual Design, October 8, 2001.

A1.2 Design

Project Objectives. Assume agency acceptance that the project objectives described in the *WAG 7 Analysis of OU 7-10 Stage II Modifications*, October 1, 2001, Section 3.3, "Stage II Objectives and Requirements," meet the 1998 ESD objectives relative to Stage II.

Applicable Design Codes and Standards. Assume that design will be performed in accordance with applicable codes and standards in effect at the time of Conceptual Design, October 8, 2001.

Safety Analyses. Assume that the updated *Preliminary Documented Safety Analysis* (PDSA) is approved to support the early procurements and construction schedule. Assume that the final *Criticality Safety Evaluation* (CSE) and final *Fire Hazards Analysis* (FHA) are completed to support the *Final Documented Safety Analysis* (FDSA) and *Technical Safety Requirements* (TSRs). Assume the FDSA and TSRs are written, reviewed, and approved to support the startup of operations schedule.

Criticality Control. Assume that the probability of a criticality is "extremely unlikely." Assume that fissile monitoring of visually suspect materials provides sufficient packaging controls for fissile material limit verification.

Waste Inventory. Assume that information from several inventory documents, including *Pit 9 Estimated Inventory of Radiological and Nonradiological Constituents* (Einerson and Thomas 1999), are adequate for project and waste management planning activities.

Mercury and Volatile Organic Contaminants. Assume that facility exhaust will not be monitored or filtered for mercury and volatile organic contaminants.

Hazard Category. Assume that the characterization/retrieval facility will be Hazard Category 2 with regards to meeting DOE hazard categorization requirements in DOE Order 5480.23 and threshold quantities in DOE-STD-1027-92 for preliminary hazard categorizations.

Structures. Assume Performance Category 2 for natural phenomena and no positive pressure or burst in the confinement.

Fire Hazard Analysis. Assume that the FHA will allow the use of Lexan for windows in the gloveboxes and confinement structure.

A1.3 Procurement

Procurement. Assume that resources and subcontractors are available. Assume that commercial grade materials will be used. Assume that only safety significant equipment will be Safety Category 2. Assume that no chemical and physical property certification is required. Assume that items are bought as commercial grade and can be upgraded to Safety Category 2 by testing, as needed.

A1.4 Construction

Construction Site Access and Laydown Area. Assume that the main LMAES north gate is used for access during construction, and the area between the LMAES processing building and Pit 9 are available for the main laydown area. An additional laydown area will be available north of the LMAES fenced area.

Utilities. Assume that the fire water line near Building 609 can be tapped for installation of risers for dry pipeline. Assume that rock excavation is not required for installation of utilities.

Operations Facilities. Assume that Buildings 645, 646, and 657 will be available for Operations offices. Assume that four RCRA/TSCA-compliant cargo containers and an existing power skid and temporary power cable are available.

Construction Initiation. Assume that construction is initiated before the draft final Remedial Design/Remedial Action Work Plan is submitted.

Risk Items. Assume management and mitigation plans are appropriate for risk items.

A1.5 Operations

Retrieval Area. Assume that retrievals will occur in the previously selected portion of the original Stage II 40 × 40-ft area defined by a 20 ft (6 m) x 145° arc.

Worker Location and Protection. Assume that personnel are not inside the confinement structure during normal operations and that the worker safety basis is bounded by the PDSA, Project Health and Safety Plans, CSE, *Operations Requirements Document* (ORD), and FHA.

Line Operations. The project cost estimate does not include costs associated with shutting down all three packaging glovebox system lines for anomalies encountered, rather, just the affected line.

Material Management. Assume that eight core samples (approximately 2 inches in diameter) of the underburden meet the project objective. Assume that all drums containing sludges have deteriorated. Assume that incompatible materials can be identified and separated. In the event of significant mixing during retrieval operations, assume that the mixed materials can be stored in the same package.

Maintenance. Assume no equipment modifications or servicing beyond normal planned maintenance and repairs.

Post Operations Maintenance. Assume that the weather enclosure structure, retrieval confinement structure, and packaging glovebox systems remain onsite and can be decontaminated. Assume that the weather enclosure structure and storage cargo containers remain uncontaminated and do not require decontamination. Assume there will not be a one-year safe shutdown period as previously included in the October report.

A1.6 Sample Analysis

Characterization. Assume that the planned sampling and characterization/data strategy is adequate and limited to only that required for safe storage of retrieved waste and current Advanced Mixed Waste

Treatment Facility (AMWTF) waste acceptance criteria. Assume that processing of the retrieved waste at the AMWTF is successfully negotiated with the operating contractor.

Agency Samples. Assume up to 20 samples of waste zone material, taken in the glovebox. Assume 5 samples of exposed underburden material, taken remotely in the pit. Sample equipment will be the same as used for BBWI samples. These samples will be transferred to the agencies. No characterization/analysis is included.

A1.7 Deactivation, Decontamination, and Decommissioning

End State. Assume that the facility can be cleaned adequately to be placed in safe shutdown and that final disposition will involve decontamination and dismantlement.

A2. COST ASSUMPTIONS

A2.1 General

Actual Work. Assume that work does not exceed proposed work scope activities or quantities contained in the Cost Estimating Detail sheets.

Meeting Schedules. Assume that the project activities are completed as identified on the project schedules. Failure to meet schedules could result in costs not reflected in these estimates, and an evaluation of these estimates will be necessary to resolve any cost changes created by the use of any alternate schedules.

Sales Tax. This estimate includes the 5% State of Idaho sales tax for subcontractors, where applicable; assume that this rate will not change.

Wages. Assume that INEEL operating contractor wages apply for the non-subcontracted portions of this work.

Hourly Wage Rates. Assume that INEEL labor rates are as published in *the INEEL Cost Estimating Guide*, DOE/ID-10473, September 2001, Rev. 1. INEEL site Davis-Bacon labor rates are located in Appendix O. Company burdened labor rates are located in Appendix O2.

Available Support. Assume that all radiological technicians and engineering, design, environmental, safety, and quality engineering support are available, as required.

Overhead Restrictions. Assume that no overhead interferences will be encountered during this project.

DOE Order 413.3. Assume any changes to DOE Order 413.3 from the October 2000 draft version will not impose any additional costs or time delays to this project.

Unplanned Events. Assume that no monies are included in the event of a manmade disaster (e.g., fire, explosion) or an act of God.

Critical Lifts. Assume that no critical lifts are required.

INEEL Equipment Availability. Assume that all equipment to be used is available when needed and does not require upgrading, modification, repair, etc.

INEEL Equipment Conditions. Assume that equipment is in good operating condition; no allowance is made for equipment operating in severe conditions or beyond periodic maintenance services. Recovery monies are included for all government owned equipment usage.

INEEL Equipment Cleaning. Assume that equipment outside the confinement structure does not require decontamination (other than a wipe down), cleaning, or replacement.

Estimated Costs. Costs incurred to date (11/25/01) and estimated costs to complete the Conceptual Design effort have been included in the estimate.

Personal Leave and Holiday. Assume that personal leave and holiday pay are not a direct charge to the project; all labor hours for environmental safety, health, and quality (ESH&Q); operations; program and construction management; quality assurance; and maintenance are based on 1,816 hours per year, which excludes 184 hours of personal leave and 80 hours of holiday pay.

Escalation Rates. Costs have been presented in FY 2002 dollars and escalated to the projected midpoint of each major activity. Escalation rates are based on rates provided by DOE-HQ, Associate Deputy Secretary for Field Management, Office of Projects, and Fixed Asset Management as shown on the escalation sheet provided as part of the estimate package. Assume that due to recent global economic activities, these rates will be sufficient.

ESH&Q. The estimated level of ESH&Q support for this project was provided by the ESH&Q subject matter experts (SME) assigned to the project team. Estimating, scheduling, and Project Management reviewed the support estimate for reasonableness and applicability.

Construction Management. A construction management pool account rate of \$35 per hour is included in the estimate, allocated for each construction management home organization personnel hour. Assume that no other pool account rates or charges are levied against these projects. Also assume that construction management does not have any responsibilities during operational, maintenance, or post-maintenance activities.

Program/Project Management. The Program/Project Management level for this project was provided by the project management SME assigned to the project team.

Performance Fee and General and Administrative Rate. A Material Handling rate of 3.9% for subcontracted portions and 1.6% for direct-purchase portions has been included on the material, equipment, and subcontract amounts. It is assumed even with the current funding and personnel reductions, this rate will not change. The General and Administrative rate of 37% has been included on the above Material Handling fee. It is assumed even with the current funding and personnel reductions this rate will not change.

A2.2 Design

Title Design. Assume that all design work is performed in-house; no provisions have been made for subcontracting the work or for subcontracting any portions of the design work to outside consultants except as noted in the estimate details.

Title Design. It has been assumed that Title II design will immediately follow Title I design with no formal Title I Design review scheduled.

A2.3 Procurement

Procurement. Assume that the time allotted in the schedule for contract development, bid, and award will be sufficient.

WES. Assume WES can be delivered per current project schedule.

A2.4 Construction

Utilities. Assume that all utilities will have the required capacities available and can be secured at the locations indicated on the conceptual drawings. Assume that utilities are temporary above-grade, except as noted on the estimate details. Assume power is available from the 12.5 kVA electrical power line.

Rock Excavation. Assume no rock excavation will be required.

Competitive Procurement. Assume that procured portions of this project are competitively bid within the local subcontracting community using contractors familiar with and up-to-date with the requirements needed to work at the INEEL; provisions are not made for a negotiated 8-A set-aside contract. Also assume that to create a competitive business environment, a sufficient quantity of qualified respondents will participate in the bidding process.

Storage Location. Assume that the area to the west of Pit 9 will be available for construction of the waste storage pad.

Storage Containers. Assume that the four existing government-owned “Connex” trailers will be used for storage and that they can be used at no additional cost to the project; no monies are included in the cost estimate to supply any other containers. Also, assume that these containers require only connection to electrical service and fire detection systems to make them suitable for the intended use, and that no modifications/additions to the interior of the containers are required.

Mobilization and Demobilization. Assume that only one mobilization and demobilization will be needed per construction subcontract. Once crews move onto the project site, no others will use the project area. Once an area is completed, work will proceed continuously until all work is completed. Crews will then demobilize from the project.

Normal Working Schedule. Assume that all construction activities are performed during a normal working schedule with no premium time. Construction activities will use current, prevailing INEEL Site Stabilization Agreement rates. No provisions are made for premium rates for labor productivity factors caused by extended or off-shift work periods. Assume that the schedule allows for normal construction periods.

Non-INEEL Equipment. Assume that subcontractor leased equipment does not require decontamination (other than a wipe down) or replacement. At the end of use, assume all equipment will be free released.

LMAES. Assume the on-going LMAES litigation or site activities will not have an adverse effect on the planned construction.

Turnover From Construction to Operations. Assume no schedule delays from construction for system turnovers.

A2.5 Operations

Cold Test Activities. Assume that the cold test takes place using simulated waste in a mocked-up environment and that the major equipment used for the test is also used during actual retrieval operation with the exception of the trench box. Monies are included to purchase a duplicate trench box that will be installed in the Cold Test Pit South.

Operations Start-up and Testing. Assume operations start-up and testing is planned to be accomplished by a contingent of BBWI and technical subcontract personnel.

Training. Operational training costs are included in the operations portion of the estimate; assume that no new training above and beyond the identified costs is required. Assume that the operating personnel will have sufficient time to properly train on the project equipment set up in the Cold Test Pit.

Subcontracting. Assume that all retrieval operations are performed in-house; no provisions are made for subcontracting this work or for any portions of the operational retrieval work to outside subcontractors.

Existing Trailers. Assume that three existing trailers (WMF 657, 645, 646), will be available for use during operations, and that the current configuration and condition of the trailers serve the intended functions without repair or alteration; no additional money is estimated for such modifications.

Office Space. Assume this project will supply additional office space over and above the identified existing trailers for 50 people (approximately 5,000 ft²), for a duration of 1 year. This added space is assumed to be in the form of leased trailers and is needed in support of Start-up and Testing, and Operations activities.

Drum Size. Assume that all waste drums are a standard size.

Operational Resource Needs. Assume Operations Management has adequately identified crew composition, duties, and technical qualification requirements that are represented in the project cost estimate. The estimated level of operations for this project was provided by the operations subject matter expert (SME) assigned to the project team. Estimating, scheduling, and Project Management reviewed the support estimate for reasonableness and applicability, and modified as needed.

Operation Readiness Review. Assume that there are no schedule impacts due to identified rework items outside the scope of project. Assume that no additional schedule time is allowed for repeating the operations Management Self-Assessment/Operational Readiness Review (MSA/ORR) sequence of activities due to failure. Assume that the operations MSA/ORR will be successful, involving one scheduled cycle.

Facility Operations, Maintenance, and Test Procedure. Assume operations management has adequately identified resource needs for procedure development and the project has provided the necessary funding.

Operation Facility Staff-up. Assume facility staffing requirements are met internally and hiring externally is not required.

Operation Shifts. Assume that the retrieval operational efforts will be made up of four crews working a total of 7 days per week and 24 hours per day. Overtime and shift differential costs are included in the resource average wage rate used.

Probe Removal. A series of probes have been placed in the ground for waste data information. This was completed in Stage I prior to the planned waste retrieval set-up. Assume the probes will be left in place during waste retrieval operations. Allowances have been factored into the estimate to address working around these probes.

Classified Objects. Assume no work stoppages for identification of classified objects.

Equipment Failure. Assume no major equipment failure that impacts schedule critical path. Assume schedule process durations time estimates have adequately captured preventative maintenance and minor maintenance requirements.

Cross Contamination of Underburden. Assume no cross contamination of underburden occurs during retrieval operations. Assume system design incorporates design requirements to minimum cross contamination of underburden..

Packaging Glovebox System Failure. Assume design accounts for reliability and durability of PGS where no dirt or waste material interferes with system operations.

Contamination of WES. Assume no contamination outside RCS and PGS, and the design adequately addresses contamination controls of ALARA.

Operator Proficiency. Assume operators never become fully proficient over a 3 1/2 month activity. Assume the operation phase is handled as a facility startup and shutdown, and senior supervisor watch will be in place during retrieval operations.

Safety Bases. Assume detailed operating procedures capture all TSR requirements and operators are trained on requirements during the training qualification phase of the operation.

Unknown Material. Assume no outlier material is encountered outside the safety analysis bases. Assume no delay to critical path schedule as a result of finding material outside the inventory and special case scenarios are excluded from cost estimates.

Equipment Failure in RCS. Assume no major equipment failure in the RCS that impact critical path schedule greater than one week.

Retrieval excavation X, Y, Z. Assume no detail X, Y, Z excavation method is being used that will impact production schedules and material tracking.

Container Certification. Assume that all waste storage containers do not require a Department of Transportation (DOT) certification and are not transported off the INEEL site by the project.

Transportation Permits. Assume that no transportation permits are required for movement of waste materials.

Safe Shutdown. Assume transition to facility safe shutdown after operations.

Overburden Backfill. Assume backfill occur prior to DD&D activities. Assume only spray fixative is used for contamination control for overburden backfill and grading activity.

A2.6 Maintenance

Maintenance. The estimated level of maintenance for this project was provided by the operations SME assigned to the project team. Estimating, scheduling, and Project Management reviewed the support estimate for reasonableness and applicability, and modified as needed.

Post Operations Maintenance. Assume that the weather enclosure structure, retrieval confinement structure, and packaging glovebox systems remain onsite and can be decontaminated. Assume that the weather enclosure structure and storage cargo containers remain uncontaminated and do not require decontamination. Assume there will not be a one-year safe shutdown period as previously included in the October report.

A2.7 Sample Analysis

A2.7.1 Waste Zone Material Samples:

Waste Stream. Assume excavated waste zone material will comprise a single waste stream.

Sampling for Characterization. Assume sampling for characterization for acceptance to AMWTF will be provided using the entire waste stream as the population of interest.

Sampling Process. Assume the sampling process will be dependent on the necessary procedure required to develop a statistical statement of the waste stream with a confidence interval of 80% and 20% error.

Number of Drums. Assume the maximum number of drums containing waste zone materials is 500.

Number of Samples. Assume a maximum of 500 samples are required to represent the contents of the excavated waste zone material.

Composition of Waste Zone Material. Assume waste zone material consists primarily of non-debris material (i.e., soil and sludge).

Types of Analyses. Assume the majority of waste zone material samples (490) require VOC, SVOC, PCB screening, CLP Metals, pH analyses for acceptance to AMWTF.

Cyanide. Assume only a minimum quantity of visually contaminated samples (10) require reactive cyanide analyses, in addition to the analyses listed above.

Batches. Assume batches of 8 samples will be analyzed.

A2.7.2 Liquid Samples:

Liquids Encountered in Glovebox. Assume liquids from the waste zone that are encountered in the glovebox will be sampled.

Percent Free Liquids. Assume 5% of the total number of drums (25 drums) contain free liquids.

Types of Analyses. Assume liquid samples require PCB analysis for acceptance to AMWTF and pH and ignitability analyses for safe storage.

Batches. Assume batches of 10 samples will be analyzed.

A2.7.3 Underburden samples:

Number of Core Samples. Assume eight underburden core samples will be collected.

Soil. Assume underburden samples consist primarily of soil.

Types of Analyses. Assume underburden samples require Am-241, Np-237, Pu isotopic, U isotopic, gamma isotopes, VOC, SVOC, CLP metals, and PCB analyses.

Batches. Assume batches of 4 samples will be analyzed.

A2.7.4 Analytical Facility:

Data Reviews. Assume data reviews (as shown on the cost estimate) include technical and QA reviews that are required to be performed by the analytical facility to verify their analytical methods. (This cost does not include WIPP review, validation, etc.)

Analytical Methods. Assume the analytical methods provided by the analytical laboratory are consistent with the analytical methods specified in the DQOs.

A2.8 Deactivation, Decontamination, and Dismantlement

Backfill. Assume the excavated area will be backfilled prior to deactivation, decontamination, and dismantlement (DD&D) activities.

Fissile Material. Assume accountability of fissile material will not be an issue during DD&D.

Contamination Control. Assume contaminated equipment and the inner surfaces of the RCS will be sprayed with a fixative to control contamination. Assume surfaces of confinement structure will not undergo a wipe down decontamination.

Vacuuming. Assume equipment inside the confinement structure and the internals of the glove box will be vacuumed to remove loose contamination.

Outside RCS. Assume all area outside of the RCS is considered radiologically clean.

Sizing. The RCS, all material and equipment inside the RCS, and the PGSs and internal equipment are assumed to be contaminated and will be sized and loaded into soft side waste bags or standard metal waste boxes.

MLLW. The RCS, all material and equipment inside the RCS, and the PGSs and internal equipment will be considered Mixed Low-Level Waste (MLLW) and will be transported offsite for treatment and disposal at Envirocare in Utah.

Steel Deck. The steel deck and the WES will be assumed to be free from contamination. Dismantlement of these structures will be performed by a subcontractor and the structural materials to be transported to the storage area at CFA.

Support. Assume minimal engineering and design support is required for the DD&D.

Additional assumptions. Additional assumptions specific to DD&D activities are included in the cost estimate detail item report.

Estimate Basis. The project cost estimate is based on assumed levels of contamination, waste classifications, and waste volumes. These assumptions have been made prior to the characterization sample collection and analysis. Unforeseen characterization results may impact the costs for this project.

A3. SCHEDULE ASSUMPTIONS

A3.1 General

Availability of Funding. Assume that all funding necessary to perform the project within the schedule is available.

Parallel Review. Assume parallel DOE and Agency (EPA, IDEQ) reviews of design documents for construction and operations.

Completion. Assume that the project fieldwork is complete when all retrieved materials have been stored, and facilities have been placed in safe shut-down and have been decontaminated and dismantled.

Fire. Assume no fire will occur that affects schedule.

Disasters. Assume no man-made disasters or acts of God will occur that affect schedule.

Changeout of Personnel. Assume that any changeout of project personnel at any level due to vacation, illness, etc. does not impact the schedule.

Availability of Equipment. Assume that all necessary equipment, tools, personal protective equipment, etc. are available, as needed, to support the schedule.

Time Review. Assume reviews will occur as scheduled.

Preliminary Documented Safety Analysis. Assume that conceptual design information is available and adequate to allow review and approval of the PDSA and does not affect schedule.

A3.2 Design

Assume that agency reviews do not result in changes to established project objectives nor to Technical & Functional Requirements (see Conceptual Design Report).

A3.3 Procurement

Procured Items. Assume procured items are received as planned.

A3.4 Construction

LMAES Litigation. Assume that the ongoing LMAES litigation does not disrupt project activities. Assume no activity interference relative to the LMAES facilities.

Field Shift Schedule. Assume a single-shift estimate basis for the construction period. Assume that winter construction is acceptable, and spring weather shutdown is no more than 2 weeks.

Change Orders. Assume that no schedule allowance is provided for change orders or field problems encountered by any suppliers or subcontractors providing construction materials, equipment, or services to the project.

A3.5 Operations

MSA/ORR. Assume that no additional schedule time is allowed for repeating the operations Management Self-Assessment/Operational Readiness Review (MSA/ORR) sequence of activities due to failure. Assume that the operations MSA/ORR will be successful, involving one scheduled cycle.

LMAES Litigation. Assume that the ongoing LMAES litigation does not disrupt project operations activities.

Field Shift Schedule. Assume waste retrieval operation will be 24 hours per day, 7 days per week.

Engineering Field Change Orders. Assume that no schedule allowance is provided for change orders or field problems encountered during operations.

Classified Objects. Assume no work stoppages for identification of classified objects.

Special Case Scenarios. Assume special case scenarios are excluded from schedule considerations.

A3.6 Maintenance

Equipment Maintenance. Assume that no schedule time is included for equipment modifications or servicing beyond normal scheduled maintenance and repair.

A3.7 Sample Analysis

Delays. Assume no delays from sample analysis activities.

A3.8 Deactivation, Decontamination, and Decommissioning

Delays. Assume no delays in schedule for DD&D activities.



Appendix B

Work Breakdown Structure

WORK BREAKDOWN STRUCTURE

1. ESH&Q

1.1 Environmental

1.1.1 Environmental General Support

1.1.2 Environmental - Design Review

1.1.3 Environmental - Construction

1.1.4 (Left Blank)

1.1.5 Environmental - Startup Testing

1.1.6 Environmental - Operations

1.1.7 Environmental - Maintenance

1.2 Safety Analysis

1.2.1 Safety Analysis - General Support

1.2.2 Safety Analysis - Construction

1.2.3 (Left Blank)

1.2.4 Safety Analysis - Operations

1.3 Safety & Health

1.3.1 Safety & Health - Design Review

1.3.2 Safety and Health - Procurement

1.3.3 Safety & Health - Construction Activities

1.3.4 (Left Blank)

1.3.5 Safety & Health - Start Up & Testing

1.3.6 Safety & Health – Operations

1.3.7 (Left Blank)

1.3.8 ESH&QA Project Management. & Administration

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- 1.4 Fire Protection
 - 1.4.1 Fire Hazard Analysis
 - 1.4.2 Fire Design Support
 - 1.4.3 FPE Construction Support
 - 1.4.4 FPE Start up and testing
 - 1.4.5 FPE Operations
 - 1.5 Radiological Control
 - 1.5.1 Radiological Control - Design Review
 - 1.5.2 Radiological Control Construction
 - 1.5.3 (Left Blank)
 - 1.5.4 Radiological Control Startup/Testing
 - 1.5.5 Radiological Control Operations
 - 1.6 Criticality Safety
 - 1.6.1 Criticality Safety General Support
 - 1.6.2 Criticality Safety - Operations
 - 1.7 Emergency Planning
 - 1.7.1 Emergency Plan Development
 - 1.7.2 Safeguards and Security
 - 1.8 Quality General Support
 - 1.8.1 Quality General Support
 - 1.8.2 Quality Design Support
 - 1.8.3 Quality Procurement Support
 - 1.8.4 Quality Construction Support
 - 1.8.5 (Left Blank)
 - 1.8.6 Quality – Start Up/Testing Support
 - 1.8.7 Quality – Operations Support

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- 1.8.8 Quality – Maintenance Support
 - 1.8.9 Quality Project Management and Administration

2. Design Engineering

- 2.1 Requirements Documents
 - 2.1.1 Technical and Functional Requirements
 - 2.1.2 System Design Criteria
 - 2.1.3 Data Quality Objectives
 - 2.1.4 Process Flow Diagrams
- 2.2 Conceptual Design Products
 - 2.2.1 Process
 - 2.2.2 Retrieval and Packaging
 - 2.2.3 Facility & Infrastructure
 - 2.2.4 Instrumentation & Control
 - 2.2.5 CD Report
 - 2.2.6 Conceptual Design Review
- 2.3 Title Design Products
 - 2.3.1 Process Design
 - 2.3.1.1 Process Flow Diagrams
 - 2.3.1.2 Process Descriptions
 - 2.3.1.3 Overburden Logic Flow
 - 2.3.1.4 Sample Logic Flow
 - 2.3.1.5 Waste Logic Flow
 - 2.3.1.6 Facility Shutdown Plan
 - 2.3.1.7 Data Quality Objectives
 - 2.3.1.8 Sampling & Analysis Plan
 - 2.3.1.9 (Left Blank)

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- 2.3.1.10 AMWTF Interface Plan
 - 2.3.1.11 (Left Blank)
 - 2.3.1.12 Process Model
 - 2.3.1.13 Process Design Support LOE
 - 2.3.1.14 Print Final
 - 2.3.2 Excavator Design for GFE
 - 2.3.2.1 Excavator Engineering Issues
 - 2.3.2.2 Excavator Procurement Specification & Drawings
 - 2.3.2.3 Excavator Modification Plan & Drawings
 - 2.3.2.4 Excavator Installation Instructions
 - 2.3.2.5 Excavator Checking
 - 2.3.2.6 Excavator Design Review
 - 2.3.2.7 Excavator Support LOE
 - 2.3.2.8 Excavator Print Final
 - 2.3.3 Packaging Glovebox Systems (PGS) for GFE
 - 2.3.3.1 Packaging Glovebox Systems Procurement Specification
 - 2.3.3.2 Packaging Glovebox Systems Procurement Drawings
 - 2.3.3.3 Packaging Glovebox Systems EDF(s)
 - 2.3.3.4 Packaging Glovebox Checking
 - 2.3.3.5 Packaging Glovebox Design Review
 - 2.3.3.6 Packaging Glovebox Support LOE
 - 2.3.3.7 Packaging Glovebox Print Final
 - 2.3.4 Fissile Monitor (FM) Design for GFE
 - 2.3.4.1 Fissile Monitor Specification Documents
 - 2.3.4.2 Fissile Monitor Interface Drawing
 - 2.3.4.3 Fissile Monitor Installation & Testing Instructions

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- 2.3.4.4 Fissile Monitor Checking
 - 2.3.4.5 Fissile Monitor Design Review
 - 2.3.4.6 Fissile Monitor Support LOE
 - 2.3.4.7 Fissile Monitor Print Final
 - 2.3.5 Drum Assay Design
 - 2.3.5.1 Drum Assay Specification Documents
 - 2.3.5.2 Drum Assay Subcontract Drawings
 - 2.3.5.3 Drum Assay EDF(s)
 - 2.3.5.4 Drum Assay Checking
 - 2.3.5.5 Drum Assay Design Review
 - 2.3.5.6 Drum Assay Support LOE
 - 2.3.5.7 Drum Assay Print Final
 - 2.3.6 Site Development Design
 - 2.3.6.1 Site Roads, Pads, & Drainage (R&P)
 - 2.3.6.2 Site Fire Water (SFW)
 - 2.3.6.3 Site Electrical
 - 2.3.6.4 Site Development Checking
 - 2.3.6.5 Site Development Design Review
 - 2.3.6.6 Site Development Support LOE
 - 2.3.6.7 Site Development Print Final
 - 2.3.7 Structures Design
 - 2.3.7.1 Floor Structure Subcontract Package
 - 2.3.7.1.1 Floor Framing Design/Layout
 - 2.3.7.1.2 Floor Framing Model
 - 2.3.7.1.3 Floor Framing Drawings
 - 2.3.7.1.4 Floor Details - Design

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- 2.3.7.1.5 Floor Details Drawings
 - 2.3.7.1.6 Floor Shoring Box Design
 - 2.3.7.1.7 Floor Shoring Box Drawings
 - 2.3.7.1.8 Floor Structure Construction Specification
 - 2.3.7.1.9 Floor EDF(s)
 - 2.3.7.2 Weather Enclosure Structure (WES)
 - 2.3.7.3 Retrieval Confinement Structure (RCS)
 - 2.3.7.4 Structures Checking
 - 2.3.7.5 Structures Design Review
 - 2.3.7.6 Structures Support LOE
 - 2.3.7.7 Structures Print Final
 - 2.3.8 Facility Design
 - 2.3.8.1 Facility Architectural Design
 - 2.3.8.2 Facility Structural Design
 - 2.3.8.2.1 Facility Structural Support/Interface Drawings
 - 2.3.8.2.2 Facility Structural Specification Sections
 - 2.3.8.2.3 Facility Structural EDF(s)
 - 2.3.8.2.4 Facility Structural LOE
 - 2.3.8.3 Facility Mechanical Design
 - 2.3.8.3.1 Facility HVAC Design
 - 2.3.8.3.2 Facility Energy Conservation EDF
 - 2.3.8.3.3 Facility Fire Protection System (FPS) Design
 - 2.3.8.3.4 Facility Retrieval Dust Suppression (RDS) Design
 - 2.3.8.3.5 Facility Compressed and Breathing Air Trailer Specification
 - 2.3.8.3.6 Facility Eyewash and Safety Showers

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- 2.3.8.4 Facility Electrical Design
 - 2.3.8.5 Facility Life Safety Instrumentation Design
 - 2.3.8.6 Facility Trailers
 - 2.3.8.7 Facility Package Checking
 - 2.3.8.8 Facility Package Design Review
 - 2.3.8.9 Facility Support LOE
 - 2.3.8.10 Facility Print Final
- 2.4 Instrumentation & Control Design
- 2.4.1 CCTV Design
 - 2.4.1.1 CCTV Procurement Specification
 - 2.4.1.2 CCTV Installation Drawings
 - 2.4.1.3 CCTV EDF(s)
 - 2.4.1.4 (Left Blank)
 - 2.4.1.5 CCTV Checking
 - 2.4.1.6 CCTV Design Review
 - 2.4.1.7 CCTV Print Final
 - 2.4.2 Monitoring & Control (M&C) Design
 - 2.4.2.1 Monitoring & Control Procurement Specification
 - 2.4.2.2 Monitoring & Control Installation Drawings
 - 2.4.2.3 Monitoring & Control EDF(s)
 - 2.4.2.4 (Left Blank)
 - 2.4.2.5 PLC Programming
 - 2.4.2.6 MMI Programming
 - 2.4.2.7 Monitoring & Control Checking
 - 2.4.2.8 Monitoring & Control Design Review
 - 2.4.2.9 Monitoring & Control Print Final

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- 2.4.3 Exhaust Monitoring Design
 - 2.4.3.1 Exhaust Monitoring Procurement Specification
 - 2.4.3.2 Exhaust Monitoring Installation Drawings
 - 2.4.3.3 Exhaust Monitoring EDF(s)
 - 2.4.3.4 (Left Blank)
 - 2.4.3.5 Exhaust Monitoring Checking
 - 2.4.3.6 Exhaust Monitoring Design Review
 - 2.4.3.7 Exhaust Monitoring Print Final
 - 2.4.4 Radiation Monitoring Design
 - 2.4.4.1 Radiation Monitoring Procurement Specification
 - 2.4.4.2 Radiation Monitoring Installation Drawings
 - 2.4.4.3 Radiation Monitoring EDF(s)
 - 2.4.4.4 (Left Blank)
 - 2.4.4.5 (Left Blank)
 - 2.4.4.6 Radiation Monitoring Checking
 - 2.4.4.7 Radiation Monitoring Design Review
 - 2.4.4.8 Radiation Monitoring Print Final
 - 2.4.5 Criticality Alarm Design
 - 2.4.5.1 Criticality Alarm Procurement Specification
 - 2.4.5.2 Criticality Alarm Installation Drawings
 - 2.4.5.3 Criticality Alarm EDF(s)
 - 2.4.5.4 (Left Blank)
 - 2.4.5.5 (Left Blank)
 - 2.4.5.6 Criticality Alarm Checking
 - 2.4.5.7 Criticality Alarm Design Review
 - 2.4.5.8 Criticality Alarm Print Final

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- 2.4.6 Fissile Monitor (FM) Installation Design
 - 2.4.6.1 FM Installation Procurement Specification
 - 2.4.6.2 FM Installation Drawings
 - 2.4.6.3 FM Installation EDF(s)
 - 2.4.6.4 FM Installation Checking
 - 2.4.6.5 FM Installation Design Review
 - 2.4.6.6 FM Installation Print Final
 - 2.4.7 Fissile Material Monitor (FMM) Development
 - 2.4.7.1 FMM SDCs
 - 2.4.7.2 Review FMM SDCs
 - 2.4.7.3 FMM Preliminary Design (CDR)
 - 2.4.7.4 Review FMM Preliminary Design (CDR)
 - 2.4.7.5 Purchase FMM Hardware & Software
 - 2.4.7.6 Integrate FMM Components Design
 - 2.4.7.7 Develop FMM Software
 - 2.4.7.8 Integrated Lab FMM S.O. Testing
 - 2.4.7.9 Write Final FMM S.O Test Plan
 - 2.4.7.10 Review FMM System
 - 2.4.7.11 FMM Acceptance Testing
 - 2.4.7.12 Accept FMM System & Turnover for Ops
 - 2.4.8 I&C Support LOE
 - 2.5 System Design Criteria
 - 2.5.1 Update & Maintain System Design Criteria
 - 2.6 System Design Descriptions
 - 2.6.1 Update T&FR
 - 2.7 (Left Blank)

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- 2.8 Engineering Support to Other Project Functions
 - 2.9 Engineering Planning
 - 2.10 Vendor Document Reviews During Procurement & Construction
 - 2.11 Emerging Issues
 - 2.12 Title Design - Manger LOE
 - 2.13 Continuing Design Engineering Support

3. Procurement

- 3.1 Excavator
- 3.2 Packaging Glovebox System (PGS)
- 3.3 Retrieval Confinement Structure (RCS)
- 3.4 Weather Enclosure Structure (WES)
- 3.5 Criticality Alarm System (CAS) and Radiological Monitoring Equipment
- 3.6 HEPA Filters and Exhaust
- 3.7 Fissile Monitoring System (FMS)
- 3.8 Site Work Subcontract Formation
- 3.9 Structures Subcontract Formation
- 3.10 Mechanical, Electrical, and Equipment Subcontract Formation
- 3.11 Technical Support Services Subcontract(s) Formation
- 3.12 Drum Assay System

4. Construction

- 4.1 Design Support
 - 4.1.1 Constructability Reviews
 - 4.1.2 Field Tours & Investigations
 - 4.1.3 Design Reviews
- 4.2 Site Utilities and Site Preparation
 - 4.2.1 Site Preparation

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- 4.2.2 (Left Blank)
 - 4.2.3 Power Distribution System
 - 4.2.4 Fire Water Installation
 - 4.3 Structural Installation
 - 4.3.1 Facility Floor Structure/Trench Box
 - 4.3.2 Erection of Environments Structure
 - 4.3.3 Erection of Retrieval Structure
 - 4.4 Mechanical/Electrical Equipment
 - 4.4.1 Set Material Handling Equipment
 - 4.4.2 Set HEPA System
 - 4.4.3 Set Excavator in Place
 - 4.4.4 Complete Misc. Elec./Mech. In Environ. & Retrieval
 - 4.5 Construction Closeout
 - 4.5.1 Complete Red Line Drawings
 - 4.5.2 Complete CC Tests
 - 4.5.3 Complete Vendor Data Submittals
 - 4.5.4 Start Up and Turnover Coordination/Support
 - 4.6 Misc. Activities
 - 4.6.1 Set Up Construction Trailers, Fences, Etc.
 - 4.6.2 Construction Support
 - 5. Safe Shutdown and D&D**
 - 5.1 Safe Shutdown and D&D
 - 6. Start-up & Testing**
 - 6.1 Administrative Procedures
 - 6.2 Detailed Procedures
 - 6.3 System Integration Testing

7. Operations

- 7.1 Administrative Procedures
- 7.2 Detailed Procedures
- 7.3 Training Procedures
- 7.4 Operator Training and Qualification
- 7.5 MSA & BBWI ORR & DOE ORR
- 7.6 Retrieval Operations

8. Maintenance

- 8.1 Administrative Procedures
- 8.2 Detailed Procedures
- 8.3 Training Procedures
- 8.4 Operator Training and Qualification
- 8.5 MSA & BBWI ORR & DOE ORR
- 8.6 Retrieval Operations

9. Project Management & Administration

- 9.1 Project Management
- 9.2 Project Controls
- 9.3 Emerging Issues
- 9.4 PEP Updates and Management
- 9.5 Risk Management Plan Updates and Management
- 9.6 Administrative Support
- 9.7 Davis Bacon Committee Case Record
- 9.8 Project Files/Records Management
- 9.9 Interface Agreements
- 9.10 R&D Interface
- 9.11 Training

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- 9.12 D&D Support
 - 9.13 RD/RA Work Plan Submittal
 - 9.14 Cost Estimating

